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- (71) Applicant (*for all designated States except US*): DSM IP ASSETS B.V. [NL/NL]; Het Overloon 1, NL-6411 TE Heerlen (NL).
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- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: ACC GENE

(57) Abstract: The present invention relates to a gene useful in a process to increase the microbial production of carotenoids. The carotenoids astaxanthin is distributed in a wide variety of organisms such as animals, algae and microorganisms. It has a strong antioxidation property against reactive oxygen species. Astaxanthin is used as a coloring reagent, especially in the industry of farmed fish, such as salmon, because astaxanthin imparts distinctive orange-red coloration to the animals and contributes to consumer appeal in the marketplace.



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# INTERNATIONAL SEARCH REPORT

Internat application No  
EP 03/10683

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/52 C12N9/00 C12P23/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N C12P

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EP0-Internal, WPI Data, Sequence Search

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99/32635 A (THAIN JOHN LESLIE ;VINCENT JOHN PHILIP (GB); CHAVDA SUBERNA (GB);) 1 July 1999 (1999-07-01)	1-22
Y	see SEQ ID NOS:2 and 3	23-25
Y	WO 00/11199 A (PIONEER HI BRED INT ;COUGHLAN SEAN J (US)) 2 March 2000 (2000-03-02) claims 9,10,21,2	23-25
X	EP 1 035 206 A (HOFFMANN LA ROCHE) 13 September 2000 (2000-09-13) the whole document	1-25
X	EP 1 158 051 A (HOFFMANN LA ROCHE) 28 November 2001 (2001-11-28) the whole document	1-25

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### ° Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

10 March 2004

Date of mailing of the international search report

12 JUL 2004

Name and mailing address of the ISA

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# INTERNATIONAL SEARCH REPORT

Inter al application No.  
PCT/EP 03/10683

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-25

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

# INTERNATIONAL SEARCH REPORT

International Application No. PCT/ EP 03/10683

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-25

Polynucleotide sequences encoding acetyl-CoA carboxylase and  
uses thereof  
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2. claim: 26

Method for producing carotenoid in a microorganism  
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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/JP 03/10683

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
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